The Vanuatu "Butterfly Sail": A Polynesian Oceanic Spritsail in Melanesia

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> Before the time when the labour trade made the natives afraid to move about, and "recruiting" meant destruction of canoes for the capture of their crews, red "butterfly" sails were the common and pleasing ornament of an island scene in the New Hebrides and Banks groups.
>
> —Codrington 1891:292

INTRODUCTION

In the first volume of *Pirogues Océaniennes*, Father Neyret, a Marist missionary assigned to Fiji, the Solomon Islands, and New Caledonia, wrote:

> The most beautiful examples of naval construction are the canoes of Malakula and its neighboring islets: the most typical model is the magnificent high seas outrigger canoe . . . , a model that must figure among the most original and interesting of those of Melanesia, and which gives us a clear idea of the creative qualities and ingeniosity of these populations, so long discredited by superficial observers in search of the sensational. (Neyret 1974, vol. 1:31, my translation)[1]

He concluded that:

> [The butterfly sail] is a variant of the simple triangular sail [Oceanic spritsail] used in East Polynesia. . . . But while in Polynesia it is used only on monodrome [tacking] canoes, in the New Hebrides [Vanuatu] it has been adapted to the amphidrome [shunting] maneuver. Although it may equally be a local invention. (Neyret 1974, vol. 1:183, my translation)[2]

Neyret's text merits close attention because Neyret is one of the few researchers to have used canoes as markers for migratory history. More importantly, he is the only one who specifically looked at the butterfly sail in Oceania. This article reconsiders Neyret's work and proposes that the butterfly rig constituted a bridge between the two most widespread sail types in Oceania, the lateen sail (used in Melanesia, Micronesia, and west Polynesia) and the spritsail (used in parts of west Polynesia and throughout east Polynesia).

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Although Oceanic canoes have been shaped by thousands of years of history, apprehending the antiquity of any particular architectural trait of these vessels is challenging, since the critical evidence—the rigging and sails—are the most perishable parts. However, this article shows that analyzing the geographical distribution as well as historical and ethnographical accounts of outrigger canoes from northern and central Vanuatu contributes to understanding the development of sailing technology in Oceania (Fig. 1).

The history of different rigs is currently in debate amongst archaeologists. Most have hypothesized that Lapita sailors used some form of Oceanic spritsail. It is argued here that the Oceanic lateen was the ancestral rig and that the spritsail was a much later innovation that developed farther east in Polynesia. Different rigs were used for different sailing maneuvers. To come about by tacking, the sailor pivots the bow through the wind and the boom passes to the other side of the canoe (as in western craft). To come about by shunting, the rig is carried or shifted from the bow to the stern (which now becomes the bow), always keeping the outrigger or smaller hull of double canoes windward. While the Vanuatu butterfly rig appears to have been an adaptation of the Oceanic spritsail to the preexisting shunting canoe tradition, a critical read of several ethnographic sources affirms that the butterfly rig was used until the early twentieth century in both tacking and shunting maneuvers. This would have been a unique way of using the butterfly sail, since in Polynesia (with one exception in the Tuamotus), the spritsail is almost always used for tacking, while the lateen is used for shunting (Fig. 2).[3]

Canoes of central and northern Vanuatu differ greatly from those of southern Vanuatu as well as those from neighboring archipelagoes, the Solomon Islands, Fiji, and New Caledonia, where traditional craft are usually rigged with the lateen.[4] In the nineteenth century and presumably earlier, two types of canoes were constructed in central and northern Vanuatu. The smaller coastal canoes, still used and built on Wala (northeast of Malekula), seem very similar to those of the past "in terms of size, number of outrigger booms and bird prow-head" (Tilley 2002 : 42).

The larger seagoing canoes, holding up to thirty people, disappeared after Europeans began colonizing the Pacific.[5] These large canoes were known as war canoes because of "the frequent fights attendant on pig and turmeric trade voyages" between Malekula, Ambrym, Raga, Oba, Maewo, Malo, and Santo (Haddon and Hornell [1936–1938] 1975, vol. 2; Hickey 1996; Hickey and Yoringmal 2013; Layard 1942 : 456).[6] The sophistication and degree of elaboration of these canoes, as noted by early ethnographers, strongly suggests that northern Vanuatu had a long tradition of seafaring. The metaphoric meanings of their construction, involving notions of "place and landscape, rootedness and journeying, exchange, gender and historical meanings," further support this argument (Tilley 2002 : 28). Rather than simply tools for migration or utilitarian objects for transport, canoes were sacred objects inhabited by spirits. Embodying the landscape and the social group, they gave their crews confidence that they could locate schools of tuna, the next island, the way home. The rich symbolic and social significance of canoes as reported in ethnographic accounts strongly contrasts with the cultural evolutionary framework used by archaeologists to analyze canoe history.

THE BUTTERFLY SAIL: DEFINITION AND EARLY DESCRIPTIONS

Crab claw sail, delta wing sail, two-boom triangular sail, Oceanic spritsail, wing tip sail: all of these terms refer to some kind of triangular sail set with the apex (the tack)

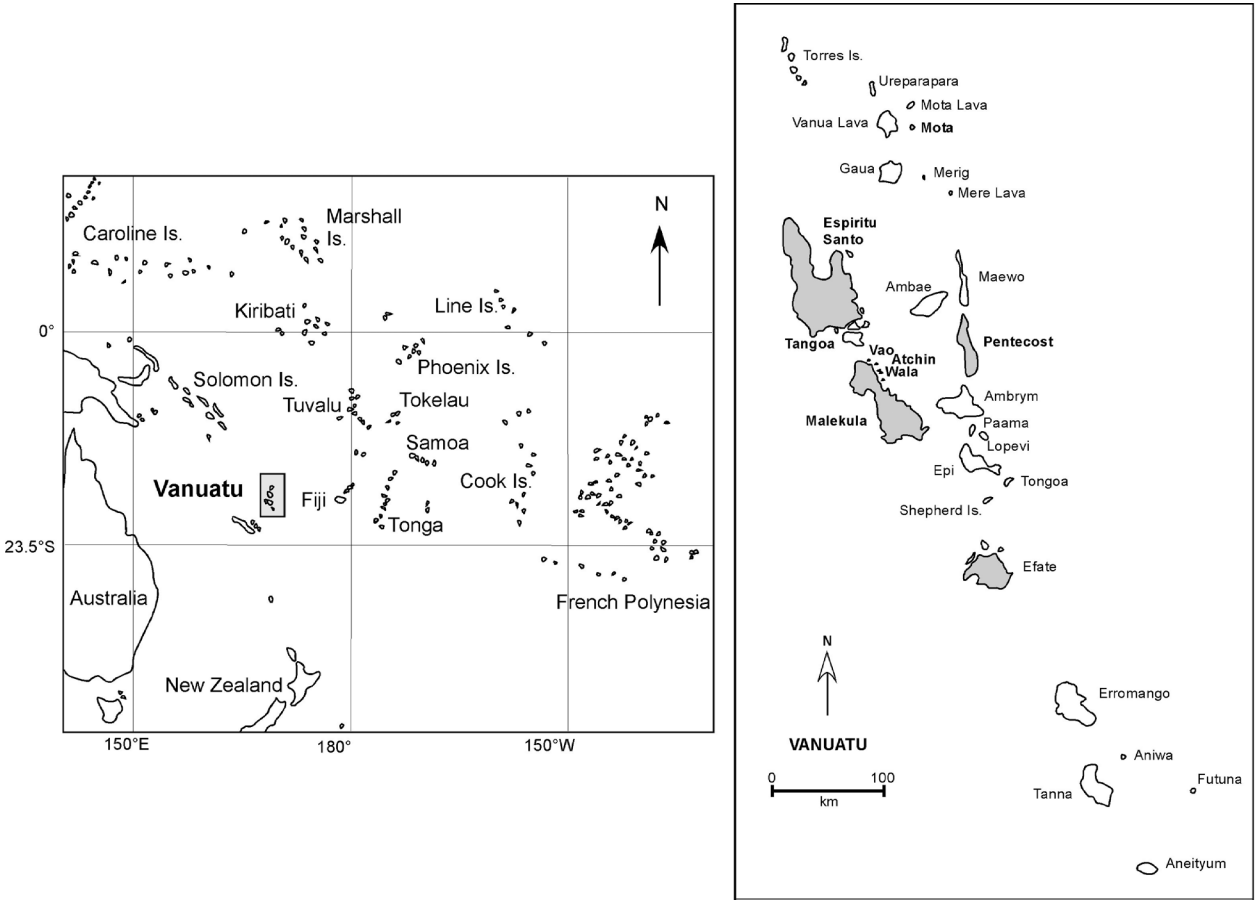

Fig. 1. The western Pacific Ocean and the location of Vanuatu (left) (after www.worldatlas.com); map of Vanuatu (right). Islands where the butterfly sail has been reported are in gray.

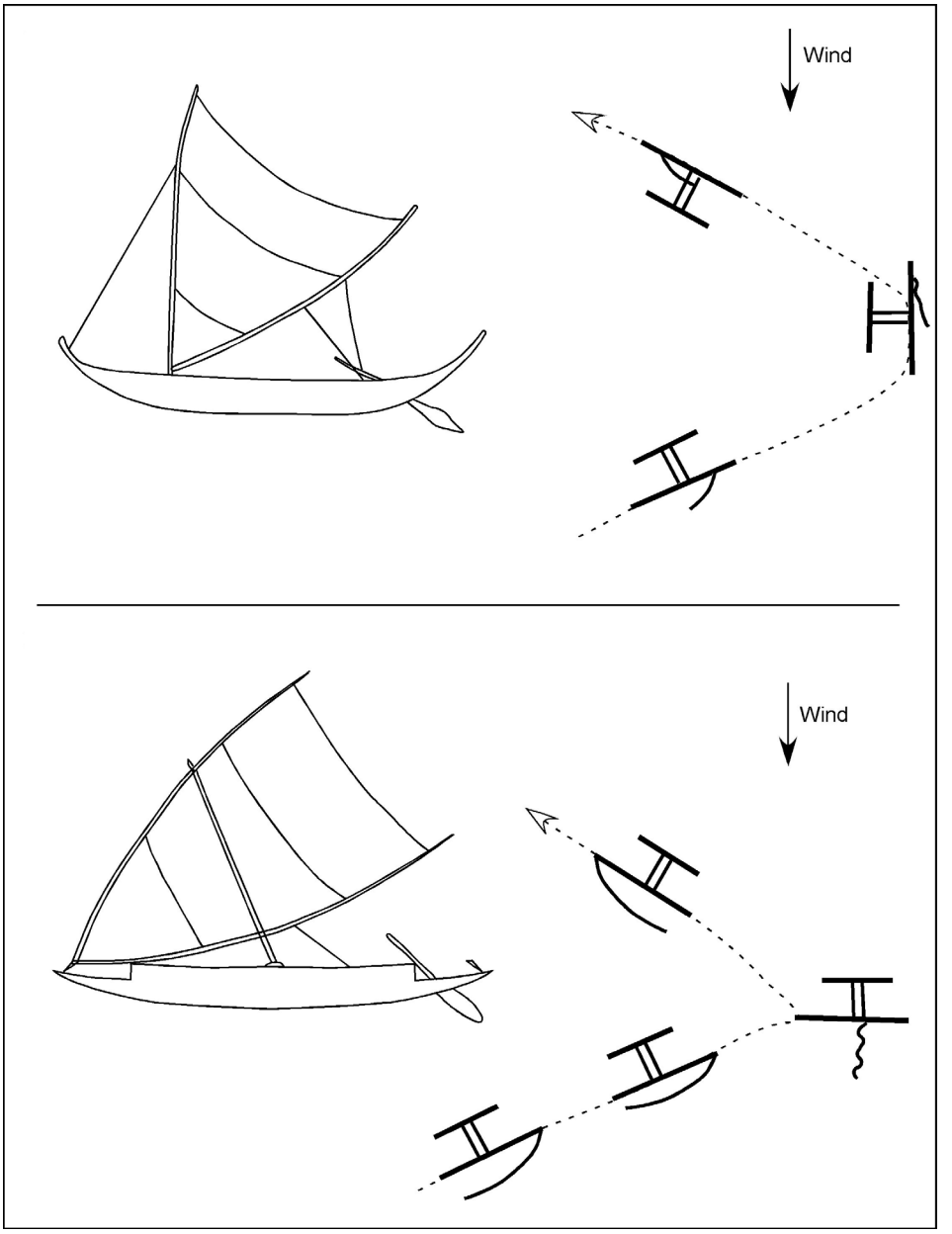

Fig. 2. Tacking and shunting maneuvers: the tacking two-spar Oceanic spritsail (top); the shunting three-spar Oceanic lateen (bottom).

Fig. 3. Large shunting canoes with butterfly sails from Malekula, c. 1900. (Photograph courtesy of the Archives Research Centre, Presbyterian Church of Aotearoa, New Zealand, http://www.presbyterian.org.nz/archives/missions/nhphoto1.htm).

downward and with the long edges supported by two spars. Infrequently or loosely defined, such terms obscure the variability and particularities of different rigs. This article uses the term "butterfly sail" following Codrington (1891), who probably coined the term to refer to a sail with its two long edges supported by straight spars, a wide tack angle (about 90°), and a deep symmetrical curve of the head (Fig. 3).

The butterly sail belonged to the family of Oceanic spritsails in which one spar acts as a functional mast. The other spar acts as a boom with its foot pivoted to the mast and controlled by sheets. This spar is also referred to as a sprit because it supports the aft peak of the sail. The sail is lashed between the spars and the whole arrangement is raised as a unit. The butterfly sail was raked well forward and supported by movable stays.

The other great family of Oceanic rig is the lateen sail, characterized by three spars. The forward spar functions as a yard with a boom attached to its fore end. The yard is supported on a movable prop mast, almost always socketed in the fore and aft center point of the main hull.

Captain Cook was the first to see sailing canoes "at some distance off" Espiritu Santo. He described their sails as "triangular, extended between two sticks one of which was the mast and the other the yard or boom" (Beaglehole 1955:515). The next mentions of the butterfly rig do not occur until the late nineteenth century. Two detailed descriptions were provided by Codrington (1891) and Somerville (1894). Robert Henry Codrington, an Anglican priest and anthropologist who visited the Banks Islands in northern Vanuatu, offered the first detailed description of the manufacture of the rig of an *aka*, an outrigger canoe from Mota Island:

> The sail, *epa*, was formed of mats, woven by women, and sewn by men with needles of tree-fern wood, or the bone of a ray's sting. The mast, *turgae*, with a forked butt, was stepped upon the midmost of the three yoke-pieces, *iwatia*, which connected the outrigger, *sama*, with the hull. The yoke-pieces were fastened to the outrigger *sama* by being lashed to wooden pegs fixed into it. Upon the foot of the mast was stepped again the forked end of a boom, *panei*; both were stayed with ropes, *tali*, and in the triangular space between the mast and boom was spread the sail, lashed to both, and sinking in a graceful curve between the two. A large paddle for steering, *turwose*, was tied to a horn, *tiqa- taso*, at the stern. (Codrington 1891 : 292–293)

Within the Melanesian and Micronesian worlds, the outstanding feature of the butterfly rig is its use of only two spars, which contrasts with the dominant three-spar rig of the Oceanic lateen (Haddon and Hornell [1936–1938] 1975; Neyret 1974). Codrington referred to the two spars as mast and boom for his readership accustomed to European rigs. Today, they are usually called mast and sprit.

In 1890, Lieutenant Boyle T. Somerville embarked on H.M.S. *Dart* to make a systematic marine survey of Efate and islands to the north. During his two-year voyage, he inventoried the outriggers still in use in these waters. He noted that on Efate, the "curiously-shaped matting sail has been entirely discarded in favour of trade calico and European pattern [sail rigs]" (Somerville 1894 : 374). He also described the sail used on large seagoing canoes, capable of carrying twenty to thirty men, in Malekula:

> [It is] shaped like a sharply horned moon lying with points upward. . . . There is no mast, properly speaking, but each of the horns of the sail is supported on a longish pole (sometimes of bamboo) . . . , the feet of which are lashed to form a cross. A fore and aft thwart [beam] is lashed to two of the transverse ones, and upon this the jaws thus formed ride; the whole concern of sail and spreaders being supported by guys, and can be dropped either on one side [end] or the other [of the thwart] as desired, or lowered quickly altogether. (Somerville 1894 : 374–376)

The longitudinal beam at a right angle to the crossbeams presumably facilitated shifting the tack of the sail by sliding along the beam rather than physically lifting and carrying the rig from forward to aft when shunting.

EARLY TWENTIETH-CENTURY OBSERVATIONS OF THE BUTTERFLY SAIL RIG USED FOR BOTH TACKING AND SHUNTING MANEUVERS

In the past, the butterfly sail was used in the central and northern islands of Vanuatu, including Mota in the Banks (Codrington 1891), Malekula (Somerville 1894), Vao (Speiser [1923] 1996), Pentecost (Hardacre cited by Haddon and Hornell [1936–1938] 1975, vol. 2 : 34), and presumably on Efate (Somerville 1894). According to Edge-Partington (writing in 1898), it was used in Tangoa, an islet off Santo (cited by Haddon and Hornell [1936–1938] 1975, vol. 2 : 37) and may also have been employed in Santo itself, since Neyret (1974, vol. 1 : 43) examined a model canoe rigged with a butterfly sail in the museum of Suva that was attributed to that island.

By the beginning of the twentieth century, the butterfly sail had disappeared. Nevertheless, it became well understood in terms of design and maneuver thanks to the careful attention John Layard gave to the study of outrigger canoes. In 1914 Layard accompanied two important men, W.H.R. Rivers and A. C. Haddon, to the meeting of the BAAS (British Association for the Advancement of Science) in Australia.[7] Afterward, Rivers and Layard continued on to Atchin Island, northeast of Malekula. Among Layard's unpublished papers held at the Mandeville Special Collections Library of the University of California, San Diego, are extensive notes on canoes.[8] Layard's

notes are here quoted at length since this is the only source that clearly distinguished small canoes from large ones:

> Unlike the small coastal canoes which have only one bow and are paddled always in the same direction, the sea-going canoes were constructed so as to be able to sail in both directions, having a bow at both ends, so that the booms had to be placed symmetrically to allow the vessel to be reversed at will. (Layard 1942:456)

> The construction of these sea-going canoes was very different from that of the smaller coastal canoes. . . . Whereas the coastal canoes have only one bow and can therefore be paddled or sailed in only one direction, these sea-going canoes have bows at either end, so that they can sail either way. . . . Another feature in which these sea-going canoes differ from the coastal ones is the arrangement of the outrigger booms (*ne-wu*), there being four of these placed close together amidships. . . . A further feature of these sea-going canoes is the addition of two wooden platforms called *ne-rets-rets*, one of these outrigger platforms being lashed to the booms on the outrigger side of the canoe, the other being built on to an extension of the booms on the other side of the canoe. . . . These sea-going canoes are too large to be paddled except for short distances, and are used mainly for sailing. There is no central mast, but the v-shaped sail (*na-mban*) with concave upper edge (plaited in long strips by women, the strips later being sewn together by men) is held in place by bamboo spars (*na-mbu na-mban*) lashed to the two outer edges of the sail. Each spar is carefully measured to equal in its length the length of the canoe between the inner ends of the bow-pieces. They are called respectively *a-tsem* (outrigger spar) [functional mast] and *tsorta* (lee spar) [boom or sprit]. My use of the term "lee spar" is due to the fact that, when sailing, the outrigger float must always be kept to windward, since if it were on the leeside, the float would be submerged and drag the canoe off its course. Being to windward however the tendency of the canoe to heel over in a high wind is counteracted by the weight of the float itself, to which is added the yet further weight of members of the crew sitting on the outrigger platform or even further out upon the booms. . . . The setting of the sail to catch the winds is regulated by six ropes . . . attached to the two spars. Two of these ropes . . . function as stays. The other four . . . function as sheets. (Layard n.d.:MSS 84, box 31, folder 6)

> The sails were made of either leaf sheaths of coconut palm, sewn together, or for longer voyages where a stronger material was needed the sail was made formerly by sewing together long strips of plaited pandanus leaves dyed red with the same technique as is still used for the making of women's mat-skirts and men's penis wrappers. . . . There being no mast, the sail was held in place by means of a forked piece of wood inserted into the lower end of each spar in such a way that the fork attached to one spar rested on a specially constructed thwart amidships, while that attached to the second spar rested on the stem of the first. (Layard n.d.:MSS 84, box 31, folder 10)

One of the peculiarities of the butterfly sail is that this rig allows coming about in two different ways, each associated with a different system of outrigger crossbeams. The large canoes had four equidistant crossbeams closely spaced together amidships. This symmetrical arrangement goes along with the shunting maneuver. The direction of the canoe is reversed at the end of each tack, the sheets being loosened and the sail turned to the required position, keeping the outrigger afloat and the mast or outrigger spar always on the windward side of the canoe. The small canoes had three crossbeams: two close together near the single bow, and one at the stern. They are spaced so as not to interfere with paddling. The canoes are paddled and sailed in only one direction, which means that they came about by tacking, with the outrigger alternating between the windward and leeward sides.

After observing the small fishing canoes used in Vao, Speiser noted that they could use the shunting maneuver when there were strong winds, leaving unmentioned that in lighter winds they tacked:

> Since the boats have only a shallow draught, they cannot tack [make good] against the wind. With a following wind, however, the boats move at an extraordinary rate. With a strong beam wind, the outrigger is placed windwards. To prevent the boat from tipping over, a man sits on the outrigger thus weighing it down. (Speiser 1996:224–225)

To summarize, the shunting maneuver was used systematically on larger canoes and occasionally on smaller ones when sea conditions warranted. This probably reflected prudent seamanship to avoid capsizing when tacking with the outrigger float to leeward where it might be forced under water by an unexpected gust of wind. Capsizing when tacking is apparently an acceptable risk in small, light canoes, in good weather close to shore. Such light canoes can be rerighted by their crews. While in general it is easier to tack a canoe than to shunt, since neither the foot of the mast, the shrouds, nor the steering paddle needs to be shifted, it appears that the butterfly rig offered some advantages in this regard compared with Oceanic lateens. The foot of the mast and the entire weight of the rig did not have to be carried from one end of the hull to the other. It could be slid along a longitudinal bar or shifted slightly from one crossbeam to another. The rig might also be simply inclined forward, leaving the position of the mast foot unchanged.

While the butterfly rig was unique to northern and central Vanuatu, the fact that it was used for both tacking and shunting maneuvers suggests that this region constituted a bridge between the western and eastern Pacific. In the western Pacific, the shunting maneuver associated with the Oceanic lateen is found throughout Micronesia, in much of Melanesia, including south Vanuatu, as well as in western Polynesia. The tacking maneuver using an Oceanic spritsail was found throughout eastern Polynesia, as well as in Samoa and Tonga (Di Piazza 2014; Haddon and Hornell [1936–1938] 1975; Neyret 1974).[9] There are a few scattered exceptions to this general statement. Shunting Oceanic spritsails are found among Mailu and Motu islanders in New Guinea, in the Loyalty Islands and Belep in New Caledonia, as well as on double canoes in the northern Tuamotus in eastern Polynesia (Haddon and Hornell [1936–1938] 1975; Neyret 1974). But to this author's knowledge, only in northern and central Vanuatu was the Oceanic spritsail (the butterfly rig) used for both maneuvers. It may be that canoe masters modified or invented a form of Oceanic spritsail that allowed them the greatest latitude in coming about.

TRENDS IN VESSEL DEVELOPMENT

Researchers have assessed trends in vessel history on the basis of distribution of sail and canoe types. Owing to the complexity of the history of Oceanic rigs, quite different scenarios have been proposed: from local innovation to proto-Polynesian relic. For example, Haddon and Hornell consider the butterfly sail "a variety of a primitive form of spritsail similar to that which was formerly used in New Zealand" and in the Marquesas (Haddon and Hornell [1936–1938] 1975, vol. 2:25; vol. 1:35). They further state "that when the proto-Polynesians entered the Polynesian area from Micronesia, probably soon after the beginning of the Christian era, their vessels were rigged with simple triangular spritsails" (Haddon and Hornell [1936–1938] 1975, vol. 3:55). The "primitive spritsail" had two straight spars, equal or sub-equal in length. Haddon and Hornell apparently considered the butterfly sail a relic of the "migration" of the Oceanic spritsail, independent of the maneuver used.

Doran considers the spritsail a "primitive" rig that was in the process of being superseded by the "superior" lateen: "What are likely to be relics of earlier use of the

Oceanic sprit are found in central New Hebrides and scattered locations in islands westward to Indonesia" (1981:80, 83). He also notes that "single outriggers that tack are older than single outriggers that use the shunting technique because the latter have not moved as far east as the former" (Doran 1981:78). In his evolutionary scheme, the butterfly rig was originally used for tacking maneuvers and later adapted to shunting.

For Neyret, the butterfly rig is a shunting "simple Melanesian sail" characterized by a triangular sail, apex downward with a yard and a boom, generally straight. He sees the sail as an "adaptation" of the tacking "simple Polynesian sail" to the shunting maneuver (Neyret 1974, vol. 1:9). The "adaptation" he meant was that the rig could be moved from one end to the other during shunting and the fore spar inclined toward the bow and the outrigger. In his conclusion, he also reckoned that the butterfly sail could well be a local innovation (Neyret 1974, vol. 1:183). Although Neyret envisioned this rig as a possible hybrid of the western (shunting) and eastern (tacking) traditions, none of the four main contributors to canoe classification and distribution (Haddon, Hornell, Neyret, and Doran) noted that the butterfly rig was actually being used for tacking. Hence, their conclusions seem incomplete at best.

The butterfly sail has been replaced by European spritsails, leg of mutton sails, and dipping lugsails with vertical masts (Hickey 1996:228–241). The former two have been adapted to the shunting maneuver in the Banks. In the central region of Vanuatu, the European spritsails and the leg of mutton come about by tacking, while the dipping lugsail, generally used on larger canoes, is shunted. When the Department of Fisheries Extension Services attempted to reintroduce the traditional butterfly rig in the 1990s, their sailing method did not appeal to local fishermen:

> The method of moving the entire rig on each tack to maintain the outrigger to windward . . . seemed just too complicated for short tacking fishermen. In the end, they were set up with the mast essentially vertical and sailed with the outrigger downwind on alternative tacks, and ended up with a "leg of mutton type sail." (Hickey 1996:252)

In effect, practical fishermen reestablished the ancient method of tacking with the newly reintroduced butterfly sails in their small canoes.

CONCLUSION

The developmental history of Pacific sailing craft is still much debated, since evidence of early vessels is sparse. Archaeological canoe pieces that have been recovered are insufficiently diagnostic to type, canoe depictions in rock art are difficult to interpret and date, and historical linguistics does not provide sufficiently detailed descriptions.

What are we left with? Two archaeologists, Anderson (2000) and Irwin (2008), have recently speculated on the characteristics of early Lapita vessels and proposed an ancestral rig that resembles a butterfly sail. For Anderson, the reconstruction of ancient colonizing vessels falls largely upon historical and ethnographical data. He reprises Haddon and Hornell's ([1936–1938] 1975, vol. 3:46) proposal that the "simple Oceanic spritsail" of the Maori canoe offers the best analog to an early colonizing vessel (Anderson 2000, 2001).[10] He also suggests that this rig may serve as a model not only for East Polynesia but for a Lapita outrigger canoe: "In Oceania, the earliest form was probably the primitive Oceanic spritsail hoisted on unstayed or lightly stayed spars" (Anderson 2000:41).

Irwin discusses essentially the same rig:

> A likely Lapita type was a single-outrigger canoe with a hull made from dugout log, and its freeboard raised with lashed-on strakes. The sail was a simple two-spar rig of a kind usually described as an "oceanic spritsail," and the canoe may have changed direction relative to the wind by some mode of tacking rather than shunting. (Irwin 2008:15)

In discussing different Oceanic spritsails, Irwin argues that:

> These various spritsails probably shared a common ancestral form (or forms) found in Lapita canoes, but nearly 3000 years intervened before European contact and much change is likely to have occurred. Although Pacific canoes that carried spritsails are described as tacking canoes it is not unlikely that in the case of early forms, when the canoe changed tack the whole rig was taken down, the canoe maneuvered by paddle on to the new course, the sail was erected again, and trimmed to the new point of sail. Sails were probably taken down in squalls as well. (Irwin 2008:16, figure 4)

The butterfly sail fits equally well with both proposed descriptions of an early canoe rig: a two-spar rig mounted on either a shunting or tacking outrigger canoe. However, even though maritime technologies tend to be quite conservative and long-lived, applying a rig from the nineteenth century to a 3500-year-old canoe seems problematic. Why not think of the butterfly rig as a link between two schools of maritime technology: the shunting western Pacific with its associated Oceanic lateen sail and the tacking eastern Pacific with its Oceanic spritsail?

If this approach is accepted, the question then arises: which type (lateen or spritsail) is more ancient? While the presumed simplicity of the spritsail suggests it is the more ancient form, the geographical distribution of the two rigs seems to support the opposite conclusion. As Kirch wrote:

> The extremely wide distribution of the Oceanic lateen sail throughout the island Pacific strongly implies that this was the sail type used on the canoes of early Austronesian speakers when they rapidly dispersed across Remote Oceania beginning around 1200 B.C. On the other hand, the restriction of the Oceanic spritsail to Eastern Polynesia shows this to be a later, and independent, development. (Kirch 2000:9)

If indeed the two-spar Oceanic spritsail is more recent than the Oceanic lateen, we are still left with two possible developmental scenarios for Vanuatu. The butterfly sail could be the ancestral form of the Oceanic spritsail. Alternatively, its isolated usage (surrounded by people using lateen sails) could indicate that it was borrowed from elsewhere, perhaps the nearby Polynesian outliers of Tikopia or Anuta. The latter are known from ethnographic sources to have used the Polynesian spritsail and to have been in contact with the Banks Islands in northern Vanuatu. It may also be the case that certain groups farther south in New Caledonia (e.g., Belep, Maré, and Uvéa in the Loyalties and the east coast of Grande Terre) borrowed spritsails from Polynesia, but did not adapt it to the tacking maneuver (Haddon and Hornell [1936–1938] 1975, vol. 2:3–13; Neyret 1974, vol. 1:20–26).[11] Although Haddon and Hornell coined the term "Oceanic spritsail," given its cultural history, "Polynesian spritsail" may be the more appropriate term.

ACKNOWLEDGMENTS

I would very much like to thank Stuart Bedford who directed me to the photograph of the two Malekula butterfly canoes in the Archives of The Presbyterian Church of Aotearoa, New Zealand (PCANZ). I would also like to thank the archive curator of PCANZ for permission to publish the photograph entitled "Malekula Canoes, c. 1900."

NOTES

1. «*Les plus belles réalisations en matière de construction navale sont les pirogues de Malakula et des îlots avoisinants: le modèle le plus typique est la magnifique pirogue de haute mer à balancier . . . , modèle qui doit figurer parmi les plus originales et les plus intéressantes de la Mélanésie, et qui nous donne une haute idée des qualités créatrices et de l'ingéniosité de ces populations si longtemps discréditées par des observateurs superficiels en quête de sensationnels*».
2. «*. . . est une variante de la voile triangulaire simple en usage en Polynésie orientale. . . . Mais tandis qu'en Polynésie elle est utilisée seulement sur des pirogues monodromes, dans les Nouvelles-Hébrides elle a été adoptée pour la manœuvre amphidrome. Il se peut également que ce soit une invention locale*».
3. That is, with the exception of the now extinct *tongiaki*, a tacking double canoe rigged with a lateen sail that was used in Tonga until the eighteenth century (Haddon and Hornell [1936–1938] 1975, vol. 1:265–272).
4. The few exceptions are found in Belep, Maré, and Uvéa (in the Loyalties) and on the east coast of the Grande Terre (Haddon and Hornell [1936–1938] 1975, vol. 2:3–13; Neyret 1974, vol. 1:20–26).
5. Beginning in the 1840s, contractors known as "blackbirders" coerced islanders into working on sugar cane plantations, gathering guano, and other labor. Frequent blackbirding (seizing canoe crews to sell them for labor), legislation against inter-island sailing, and the introduction of steamers likely contributed to the disappearance of the large canoes (Docker 1970; Hickey 1996:227).
6. While such late nineteenth-century voyages involved distances up to 80 km, they seem rather short compared to voyaging in other parts of Melanesia and Polynesia (Tilley 2002:44). In the more distant past, these canoes may have been used for longer voyages, as their wide distribution within Vanuatu seems to suggest.
7. Two of their students, A. R. Radcliffe Brown and B. Malinowski, also accompanied them to the conference.
8. The Cambridge Museum has put descriptions of Layard's photographs from his notes (edited by H. Geismar) online, albeit without the photographs themselves, at: http://maa.cam.ac.uk/maa/category/collections-2/catalogue/. They can be found by searching under keywords "Layard, Atchin, canoe."
9. Haddon and Hornell ([1936–1938] 1975, vol. 1:186) argue that Manihiki outrigger canoes tack, but shunt when temporarily rigged as double canoes, but this author finds the sources ambiguous on this point.
10. Haddon and Hornell would probably have disagreed with Anderson about the reason for their poor performance to windward. For Anderson, the performance of the historical Maori rig, essentially used downwind, is close to ancient craft (Anderson 2000:32). For Haddon and Hornell, Maori canoes having suffered "from the abandonment of overseas voyaging and the intense use of paddle propulsion" did not perform as well as the original type of sail (Haddon and Hornell [1936–1938] 1975, vol. 3:46). For a critique of the evolution or devolution of Maori canoes, as well as a review of canoe performance, see Irwin (2008:18–19).
11. Tuamotu may represent an alternative case wherein canoe masters retained the traditional spritsail and adapted their tacking canoes to shunting.

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ABSTRACT

The butterfly rig, an Oceanic spritsail generally used tacking in a Melanesian world dominated by the shunting Oceanic lateen, is herein examined. The author goes back to original historical and ethnographical sources, particularly those of Layard from central Vanuatu in the early twentieth century, and uses this case to investigate the development of sailing technology in Oceania. It is argued here that although this rig resembles that of the reconstructed Lapita canoe as proposed by archaeologists, the butterfly sail may more convincingly be thought of as an Oceanic spritsail borrowed from Polynesia and adapted to the traditional shunting maneuver. The implications of such a scenario are important for our understanding of design, construction, and performances of ancient canoes. It is probably reasonable to think of Lapita sailors as shunting their lateen rigged outriggers while the Oceanic spritsail and its tacking maneuver were innovated farther east in Polynesia and later in time. In between these two schools of navigation, interaction and borrowing gave birth to a hybrid model: the butterfly sail. KEYWORDS: Oceanic spritsail, butterfly sail, maritime history, canoe classification, traditional boat building, Vanuatu, Melanesia.